REMARKS

The Office Action of December 12, 2007 has been received and carefully reviewed. It is submitted that, by this Amendment, all bases of rejection and objection are traversed and overcome. Upon entry of this Amendment, claims 1-33 remain in the application. Claims 1, 9, 12, 17, 25 and 33 have been amended. Basis for the amendments can be found throughout the specification, at least in paragraphs [0003]-[0005]. Reconsideration of the claims is respectfully requested.

Claims 1-33 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shioya et al. (U.S. Patent No. 6,095,636) in view of Lavery et al. (WO 0037258). Furthermore, claims 1-33 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsumoto et al. (U.S. Patent Application Serial No. 2002/0071014) in view of Lavery et al. (WO 0037258).

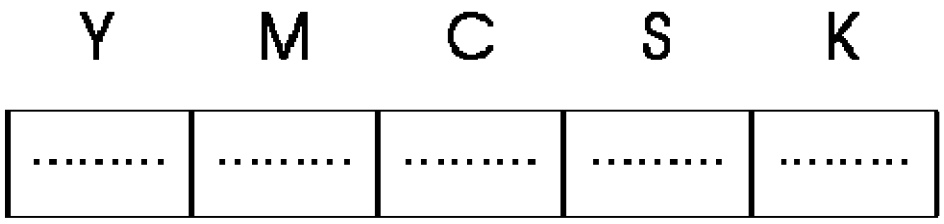
Applicants' invention as recited in claim 1 relates to a print head including: an orifice plate including at least two orifices. At least one orifice prints a first reactive ink. At least one other orifice prints a fixer or a second reactive ink. The physical proximity of the at least one orifice and the at least one other orifice is not limited. Furthermore, mixing of reactants on the print head from the at least one orifice and the at least one other orifice is not otherwise prevented or minimized by the printhead. The first reactive ink and the fixer or the second reactive ink react to form a solid precipitate. The solid precipitate is redispersible or redissolvable in at least one of the first reactive ink, or the fixer or the second reactive ink. When the solid precipitate forms on the printhead, the solid precipitate is able to redisperse or redissolve, thus avoiding clogging of the printhead.

Lavery teaches a system in which a positively charged fixer reacts with negatively charged ink.

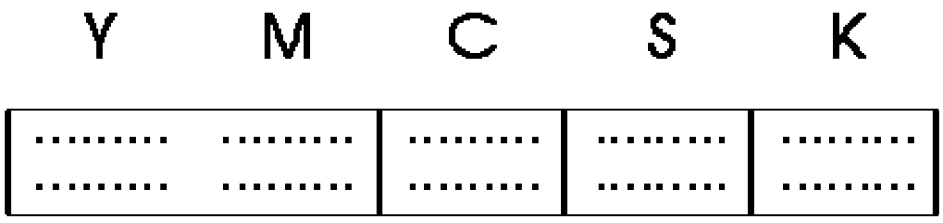
Shioya teaches an orifice plate in Figure 1 of the Shioya specification, which includes at least two orifices with at least one orifice printing a reactive ink and at least one other orifice printing a fixer. However, in the embodiment of the orifice plate arrangement shown in Figure 1 in Shioya, the only practical ways of positioning

the at least one orifice and the at least one other orifice in relation to each other minimize or eliminate mixing of the reactive inks and the fixer.

Submitted with this amendment is a Declaration under 37 C.F.R. § 1.132 prepared by the inventor, Dennis Parazak, of the present application. In the Declaration, he explains that the fixer nozzles in the embodiment shown in Figure 1 of Shioya would need to be arranged in such a way that the mixing of the fixers and inks is minimized or eliminated. Even though the specific arrangement of the arrays of nozzles is not shown, it would only be practical, if at all, to use the arrangement of Figure 1 if the nozzles were arranged in either the following way:



or other related arrangements using multiple rows of nozzles, such as



The above arrangements, even though the most practical arrangement of nozzle rows that would be possible for the general arrangement shown in Shioya's Figure 1, would all require a very large printhead (hundreds of nozzles in each row) in order to have a practical printing throughput. To make such a printhead practical would be very expensive. The embodiments shown in Figures 4 and 6, both of which put the reactive ink and fixer on separate orifice plates, thus completely avoiding the

problem of mixing of the reactive ink and the fixer on a printhead, are also somewhat impractical and expensive from a throughput perspective, but less so than Figure 1.

Based on the evidence in the Declaration under 37 C.F.R. § 1.132, it is clear that Shioya's Figure 1 minimizes mixing of ink and fixer. Further, Figures 4 and 6 completely prevent such mixing by putting the ink and fixer orifices on separate orifice plates. Of the three embodiments, Figure 1 would be the least practical embodiment because of the throughput concerns explained by Dennis Parazak. In any case, one skilled in the art would understand that all of the embodiments described in Shioya show that mixing of ink and fixer would either be minimized or completely prevented.

The factual evidence provided by the inventor in the Declaration under 37 C.F.R § 1.132 shows clearly that Shioya et al. does indeed limit the physical proximity of the at least one orifice and the at least one other orifice to the point of minimizing or preventing the mixing of the ink and the fixer. In no way does Shioya et al. suggest a system in which a reactive ink and a fixer can easily react to form a solid precipitate in the orifice of the fixer or reactive inks and still fire reliably. Such a reaction would occur at a minimum in the arrangement of Shioya et al. Figure 1, and not at all in the arrangements of Figures 4 and 6. Thus, Shioya et al. does not disclose, teach or suggest the requirement that the solid precipitate is redispersible or redissolvable in at least one of the reactive ink or the fixer. If such a solid precipitate formed on the printhead of Shioya et al. Figure 1, the solid precipitate would not be able to redisperse or redissolve, thus risking clogging of the printhead.

For the above reasons, the applicants assert that the Examiner did not present a *prima facie* case of obviousness under §103(a), based on the combination of Shioya et al. with Lavery et al. Thus, the §103(a) rejection based on these references should be withdrawn.

Matsumoto et al. teaches a system which prints both an ink and a fixer. It employs an elaborate sealing and recovery system to prevent the ink and fixer from

mixing before they can precipitate. In paragraph 122 of Matsumoto, to which the examiner refers, Matsumoto states as follows:

> "It has been already discussed that the print performance improving liquid and the ink, when mixed, will become solidified. When three or more orifice rows are used as in this embodiment, the cap pressing state is likely to become uneven, increasing the risk of the print performance improving liquid and the inks coming into contact. This embodiment, therefore, employs a construction in which the elastic body 27 is made to press against the surface of the print performance improving liquid orifices 13b more firmly than other elastic bodies 26 so that, of the four rows of orifices, **only the print performance improving liquid orifices 13b are securely closed**. This construction enables the **print performance improving liquid** to be **reliably sealed**. **If different inks** (in this case, inks ejected from the three rows of nozzles 13a) **should mix, no problem arises, such as solidifying of inks, and the only problem of color mixing can be solved to some extent by performing the recovery operation**." (emphasis added)

In this paragraph, Matsumoto is not stating that ink and fixer are allowed to mix. Rather they are stating that they are **not allowed to mix**. Because of Matsumoto's elaborate system to prevent mixing of ink and fixer, the only mixing that occurs, occurs between different inks. **The mixing of different inks does not produce formation of solid precipitate.** Instead, it produces **mixed colors** which are **wiped up by Matsumoto's "recovery operation"**.

This recovery operation (as described in paragraphs 90 through 98) is a system by which, among other things, "[i]n the event that the ink or the print performance improving liquid or both should leak, the liquid seeping gradually toward the other orifice group by capillary action generated at the joint portion between the protective tape 3 and the orifice plate surface can be blocked by the opening 23 formed in the protective tape 3 that nullifies the capillary action." (paragraph 90, lines 5-11).

Clearly there is nothing in Matsumoto about ink/fixer precipitate which is redispersible and/or redissolvable. Matsumoto's goal is to completely prevent the formation of such a precipitate. When ink mixing occurs in the Matsumoto system, the system cleans it up. Matsumoto does not teach or suggest any other method of dealing with ink/fixer precipitate, because its occurrence is precluded. Such

elaborate measures to prevent mixing would not be needed in a system in which the ink/fixer precipitate are redispersible and/or redissolvable.

For the above reasons, the applicants assert that the examiner has failed to present a prima facie case of obviousness based on §103(a) with the combination of Matsumoto and Lavery. As stated above, Lavery teaches a system in which a positively charged fixer reacts with negatively charged ink. As with Shioya et al., Matsumoto does not disclose, teach or suggest that the solid precipitate is redispersible or redissolvable in at least one of the reactive ink or the fixer. Applicants request that both §103(a) rejections be withdrawn.

As such, it is submitted that Applicants' invention as defined in independent claims 1, 9, 17, 25 and 33 and in those claims depending ultimately therefrom, is not anticipated, taught or rendered obvious by Shioya et al., Matsumoto or Lavery, either alone or in combination, and patentably defines over the art of record.

In summary, claims 1-33 remain in the application. It is submitted that, through this Amendment, Applicants' invention as set forth in these claims is now in a condition suitable for allowance.

Further and favorable consideration is requested. If the Examiner believes it would expedite prosecution of the above-identified application, he is cordially invited to contact Applicants' Attorney at the below-listed telephone number.

Respectfully submitted,

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